



GILL CREEK FISH SURVEY 2004

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Niagara Power Project FERC No. 2216

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ABBREVIATIONS

Agencies

NYPA New York Power Authority

Units of Measure

°C degrees Celsius, degrees Centigrade

mg/L milligrams per liter

mm millimeter

µs/cm microsiemens per centimeter

Environmental

SAV submerged aquatic vegetation

Miscellaneous

NPP Niagara Power Project

RTE Rare, Threatened, and Endangered

SOC species of concern

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1.0 INTRODUCTION

The New York Power Authority (NYPA) is engaged in the relicensing of the Niagara Power Project (NPP) in Lewiston, Niagara County, New York. The present operating license of the plant expires in August 2007. As part of its preparation for the relicensing of the Niagara Power Project, NYPA is developing information related to the ecological, engineering, recreational, cultural, and socioeconomic aspects of the Project.

One of the studies NYPA agreed to conduct as part of the relicensing process, at the request of the Tuscarora Environment Program, was a fish survey of Gill Creek. The purposes of the study were to provide a better description of the distribution and composition of fish species in Gill Creek during spring, summer, and fall, and a general characterization of aquatic habitat in the creek at the locations where fish were sampled.

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2.0 METHODS

2.1 Investigation Area

The investigation area was the portion of Gill Creek extending from Buffalo Avenue to approximately 2,500 feet upstream of Garlow Road on Tuscarora Land, excluding Hyde Park Lake and tributaries of Gill Creek ([Figure 2.1-1](#)).

2.2 Fish Sampling and Handling

Fish sampling was done in Gill Creek on May 19-20, July 12, and September 22, 2004 by seining, electrofishing, or a combination of both.

Captured fish were identified and enumerated in accordance with Standard Operating Procedures ([Appendix A](#)) by Dennis Dunning, Jason George, Mike Krumrine, Alex Levy, and John Magee. The total length of captured largemouth bass, smallmouth bass, yellow perch and fish belonging to the pike family was also recorded.

2.3 Habitat Descriptions

Habitat descriptions were assigned using the method and descriptions of Arend ([1999](#)), Chapter 8. Aquatic habitats were generally characterized as one of the following habitat types:

Riffle: shallow reach with moderate turbulence, moderate water velocities, and a slope < 4%. Riffles are generally characterized by the occurrence of small ripples, waves, and eddies, which are caused by small hydraulic jumps over rough bed material;

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Run: moderately shallow reach with non-turbulent water, no major flow obstructions and little to no surface agitation;

Pool: aquatic habitat with a gradient less than 1 % that is generally deeper and wider than the habitat directly upstream and downstream;

Glide: wide channel lacking a definite thalweg with non-turbulent low to moderate water velocities. A glide usually occurs at the transition between a pool and a riffle.

Water depths were approximated for each site and the presence of aquatic vegetation was also noted when observed.

2.4 Water Quality Sampling

Water temperature and dissolved oxygen were measured, using a YSI 55 meter, and recorded at each sampling location on May 19-20, July 12, and September 22. Conductivity was measured using a Corning CD-55 conductivity meter, and recorded during July and September. A qualitative description of water clarity was also noted at each sampling site.

2.5 Data Recording

Data recording was done using a pen computer directly into an integrated Geographical Information System (GIS). Orthophotos with a one-foot spatial resolution from the year 2002 were loaded into the pen computer along with a data dictionary before commencing field activities. Sampling sites were mapped by locating the site on the orthophotos and drawing a line along the representative portion of the creek. At each site, information was recorded on the environmental conditions (e.g., weather, water temperature, dissolved oxygen concentration, and conductivity), the sampling equipment used and specifications/settings (e.g., size of seines, and electrofisher voltage, frequency, duty cycle and effort), the number of fish captured per species, the number of fish observed, and the number of fish preserved for later identification.

Non-Internet Public (NIP) information has been removed from the following page(s).

**This material is contained in:
Volume 2
Section: Gill Creek Fish Survey 2004**

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**FIGURE 2.1-1
INVESTIGATION AREA AND FISH SURVEY SITES**

[NIP – General Location Maps]

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3.0 RESULTS

The gear used and descriptions of the habitat characteristics at each site are listed in [Table 3.0-1](#). The taxa of fish caught in Gill Creek are listed alphabetically by common name in [Table 3.0-2](#) and phylogenetically by scientific name in [Table 3.0-3](#). The numbers of fish caught are listed by species, month, method of capture, and site number in [Table 3.0-4](#) through [Table 3.0-19](#). Total lengths (mm) of measured fish are presented by month, method of capture, and site number in [Table 3.0-20](#) through [Table 3.0-25](#).

Water quality data are presented in [Appendix B](#).

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**TABLE 3.0-1
GEAR USED AND GENERAL HABITAT CHARACTERISTICS BY SITE IN GILL CREEK
DURING 2004**

Site #	Gear	General Aquatic Habitat Characteristics
1	Blocking seine	Shallow (<1 ft), low gradient riffle
1	Electrofishing downstream into a blocking seine	Shallow (<1 ft), low gradient riffle
2	50-foot seine haul	Shallow (<2 ft), lentic area
3	Blocking seine	1-3 ft deep, pool and short, low gradient riffle
3	Electrofishing downstream into a blocking seine	1-3 ft deep, pool and short, low gradient riffle
4	50-foot seine haul	3 ft deep pool
5	Electrofishing	1-3 ft deep pool
6	20-foot seine haul	<1 ft deep, in open box culvert on Hyde Park Golf Course
7 ¹	Electrofishing downstream into a blocking seine	1-3 ft deep run and pool
7 ¹	Blocking seine	1-3 ft deep pool
7 ¹	Electrofishing	1-3 ft deep run and pool and <1 ft deep low gradient riffle
8	Blocking seine	1-2 ft deep glide and run
8	Electrofishing downstream into a blocking seine	1-2 ft deep glide and run
9	Electrofishing	1-2 ft deep glide and run
10	Electrofishing	1 ft deep run and <1 ft deep low gradient riffle
11	20-foot seine haul	1-2 ft deep glide
11	Electrofishing	1-2 ft deep run and low gradient riffle
12	Electrofishing	1-3 ft deep run and glide
13	Electrofishing	1-3 ft deep glide
14	Blocking seine	1-3 ft deep pool
14	Electrofishing downstream into a blocking seine	1-3 ft deep pool
15	Electrofishing	1 ft deep run
16	20-foot seine haul	1-2 ft deep pool
16	Electrofishing	1-2 ft deep pool with submerged aquatic vegetation (SAV) and small woody debris

¹ Dense SAV precluded sampling with a seine or blocking net in September. Only electrofishing was conducted in September.

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TABLE 3.0-2

**COMMON AND SCIENTIFIC NAMES OF FISHES CAUGHT IN GILL CREEK BY SEINING
AND ELECTROFISHING DURING MAY, JULY, AND SEPTEMBER 2004 LISTED
ALPHABETICALLY BY COMMON NAME**

Common Name	Scientific Name
Alewife	<i>Alosa pseudoharengus</i>
Banded killifish	<i>Fundulus diaphanus</i>
Black crappie	<i>Pomoxis nigromaculatus</i>
Blacknose dace	<i>Rhinichthys atratulus</i>
Bluegill	<i>Lepomis macrochirus</i>
Bluntnose minnow	<i>Pimephales notatus</i>
Brook stickleback	<i>Culaea inconstans</i>
Brown bullhead	<i>Ameiurus nebulosus</i>
Carp	<i>Cyprinus carpio</i>
Central mudminnow	<i>Umbra limi</i>
Central stoneroller	<i>Campostoma anomalum</i>
Common shiner	<i>Luxilus cornutus</i>
Creek chub	<i>Semotilus atromaculatus</i>
Creek chub/fallfish	<i>Semotilus sp.</i>
Emerald shiner	<i>Notropis atherinoides</i>
Fathead minnow	<i>Pimephales promelas</i>
Golden shiner	<i>Notemigonus crysoleucas</i>
Green sunfish	<i>Lepomis cyanellus</i>
Largemouth bass	<i>Micropterus salmoides</i>
Logperch	<i>Percina caprodes</i>
Minnow sp.	Cyprinidae
Mottled sculpin	<i>Cottus bairdi</i>
Pumpkinseed	<i>Lepomis gibbosus</i>
Rainbow darter	<i>Etheostoma caeruleum</i>
Rock bass	<i>Ambloplites rupestris</i>
Round goby	<i>Neogobius melanostomus</i>
Sculpin	<i>Cottus sp.</i>
Smallmouth bass	<i>Micropterus dolomieu</i>
Spotfin shiner	<i>Cyprinella spiloptera</i>
Spottail shiner	<i>Notropis hudsonius</i>
Suckers	<i>Catostomus sp.</i>
Sunfish	<i>Lepomis sp.</i>
Tadpole madtom	<i>Noturus gyrinus</i>
White crappie	<i>Pomoxis annularis</i>
White perch	<i>Morone americana</i>
White sucker	<i>Catostomus commersoni</i>
Yellow bullhead	<i>Ameiurus natalis</i>

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TABLE 3.0-3

**COMMON AND SCIENTIFIC NAMES OF FISHES CAPTURED IN GILL CREEK BY SEINING
AND ELECTROFISHING DURING MAY, JULY, AND SEPTEMBER 2004 LISTED
PHYLOGENETICALLY¹ BY ORDER AND FAMILY**

Order	Family	Species	
		Scientific Name	Common Name
Clupeiformes	Clupeidae	<i>Alosa pseudoharengus</i>	Alewife
Cypriniformes	Cyprinidae	<i>Campostoma anomalum</i>	Central stoneroller
Cypriniformes	Cyprinidae	<i>Cyprinella spiloptera</i>	Spotfin shiner
Cypriniformes	Cyprinidae	Cyprinidae	Minnnow
Cypriniformes	Cyprinidae	<i>Cyprinus carpio</i>	Carp
Cypriniformes	Cyprinidae	<i>Luxilus cornutus</i>	Common shiner
Cypriniformes	Cyprinidae	<i>Notemigonus crysoleucas</i>	Golden shiner
Cypriniformes	Cyprinidae	<i>Notropis atherinoides</i>	Emerald shiner
Cypriniformes	Cyprinidae	<i>Notropis hudsonius</i>	Spottail shiner
Cypriniformes	Cyprinidae	<i>Pimephales notatus</i>	Bluntnose minnow
Cypriniformes	Cyprinidae	<i>Pimephales promelas</i>	Fathead minnow
Cypriniformes	Cyprinidae	<i>Rhinichthys atratulus</i>	Blacknose dace
Cypriniformes	Cyprinidae	<i>Semotilus atromaculatus</i>	Creek chub
Cypriniformes	Cyprinidae	<i>Semotilus</i> sp.	Creek chub/fallfish
Cypriniformes	Catostomidae	<i>Catostomus</i> sp.	Sucker
Cypriniformes	Catostomidae	<i>Catostomus commersoni</i>	White sucker
Siluriformes	Ictaluridae	<i>Ameiurus natalis</i>	Yellow bullhead
Siluriformes	Ictaluridae	<i>Ameiurus nebulosus</i>	Brown bullhead
Siluriformes	Ictaluridae	<i>Noturus gyrinus</i>	Tadpole madtom
Salmoniformes	Umbridae	<i>Umbra limi</i>	Central mudminnow
Atheriniformes	Cyprinodontidae	<i>Fundulus diaphanus</i>	Banded killifish
Gasterosteiformes	Gasterosteidae	<i>Culaea inconstans</i>	Brook stickleback
Scorpaeniformes	Cottidae	<i>Cottus bairdi</i>	Mottled sculpin
Scorpaeniformes	Cottidae	<i>Cottus</i> sp.	Sculpin
Perciformes	Percichthyidae	<i>Morone americana</i>	White perch
Perciformes	Centrarchidae	<i>Ambloplites rupestris</i>	Rock bass
Perciformes	Centrarchidae	<i>Lepomis cyanellus</i>	Green sunfish
Perciformes	Centrarchidae	<i>Lepomis gibbosus</i>	Pumpkinseed
Perciformes	Centrarchidae	<i>Lepomis macrochirus</i>	Bluegill
Perciformes	Centrarchidae	<i>Lepomis</i> sp.	Sunfish
Perciformes	Centrarchidae	<i>Micropterus dolomieu</i>	Smallmouth bass
Perciformes	Centrarchidae	<i>Micropterus salmoides</i>	Largemouth bass
Perciformes	Percidae	<i>Etheostoma caeruleum</i>	Rainbow darter
Perciformes	Percidae	<i>Percina caprodes</i>	Logperch

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TABLE 3.0-3 (CONT.)

**COMMON AND SCIENTIFIC NAMES OF FISHES CAPTURED IN GILL CREEK BY SEINING
AND ELECTROFISHING DURING MAY, JULY, AND SEPTEMBER 2004 LISTED
PHYLOGENETICALLY¹ BY ORDER AND FAMILY**

Order	Family	Species	
		Common Name	Scientific Name
Perciformes	Gobiidae	<i>Neogobius melanostomus</i>	Round goby
Perciformes	Centrarchidae	<i>Pomoxis annularis</i>	White crappie
Perciformes	Centrarchidae	<i>Pomoxis nigromaculatus</i>	Black crappie

¹Nelson et al. ([2004](#))

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TABLE 3.0-4

NUMBER OF FISH CAUGHT IN GILL CREEK DURING 2004 AT SITE 1 BY COMMON NAME, METHOD OF CAPTURE, AND MONTH

Common Name	Number Caught						Total
	Electrofishing ¹			Seining ¹			
	May	July	September	May	July	September	
Alewife						1	1
Bluegill			4				4
Bluntnose minnow	22	21	18	372	25	3	461
Carp			1				1
Common shiner				1			1
Emerald shiner	29			513	7		549
Fathead minnow				1			1
Golden shiner			1	1	1	3	6
Green sunfish			1				1
Largemouth bass			5			5	10
Lepomis sp.					1		1
Pumpkinseed	1		2			1	4
Rock bass	3	1		5			9
Smallmouth bass			1				1
Spottail shiner	4		1	22			27
Tadpole madtom		1					1
White perch	1						1
White sucker				15			15
Total	60	23	34	930	34	13	1094

¹Electrofishing downstream into a blocking seine.

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**TABLE 3.0-5
NUMBER OF FISH CAUGHT IN GILL CREEK DURING 2004 AT SITE 2 BY COMMON NAME, METHOD OF CAPTURE, AND MONTH**

Common Name	Number Caught						Total
	Electrofishing ¹			Seining			
	May	July	September	May	July	September	
Alewife	-	-	-			37	37
Banded killifish	-	-	-		1		1
Bluegill	-	-	-	3	5	28	36
Bluntnose minnow	-	-	-	38	1	6	45
Brown bullhead	-	-	-	1			1
Carp	-	-	-	2			2
Emerald shiner	-	-	-	65			65
Golden shiner	-	-	-	8		9	17
Green sunfish	-	-	-		1	1	2
Largemouth bass	-	-	-	1	1	4	6
Minnows	-	-	-		4		4
Pumpkinseed	-	-	-	13	36	20	69
Spotfin shiner	-	-	-		5		5
Spottail shiner	-	-	-	21		2	23
Sunfish	-	-	-	7	2		9
Tadpole madtom	-	-	-		1	1	2
White sucker	-	-	-	34	3	6	43
Total	-	-	-	193	60	114	367

¹ Electrofishing was not done at this site.

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TABLE 3.0-6

NUMBER OF FISH CAUGHT IN GILL CREEK DURING 2004 AT SITE 3 BY COMMON NAME, METHOD OF CAPTURE, AND MONTH

Common Name	Number Caught						Total
	Electrofishing			Seining			
	May	July	September	May	July	September	
Alewife						2	2
Banded killifish						1	1
Black crappie						1	1
Bluegill			28			14	42
Bluntnose minnow	11	11	14	22	48	44	150
Carp	1					1	2
Emerald shiner	27			27			54
Golden shiner		1	3		8	6	18
Green sunfish	2	8	2		1	2	15
Largemouth bass		5	4		1	4	14
Pumpkinseed	1	9	10	8	15	4	47
Rock bass	2	1					3
Smallmouth bass				1			1
Spottail shiner				2		1	3
Sunfish	5	3		4			12
White sucker		1		1	3		5
Total	49	39	61	65	76	80	370

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**TABLE 3.0-7
NUMBER OF FISH CAUGHT IN GILL CREEK DURING 2004 AT SITE 4 BY COMMON NAME, METHOD OF CAPTURE, AND MONTH**

Common Name	Number Caught						Total
	Electrofishing ¹			Seining			
	May	July	September	May	July	September	
Bluegill	-	-	-	2	9	16	27
Bluntnose minnow	-	-	-	1		4	5
Carp	-	-	-		1		1
Fathead minnow	-	-	-		1		1
Golden shiner	-	-	-	2		4	6
Largemouth bass	-	-	-		4		4
Pumpkinseed	-	-	-	8	12	24	44
Sunfish	-	-	-	3			3
White crappie	-	-	-		9	7	16
White perch	-	-	-	1	22	6	29
White sucker	-	-	-	2		2	4
Total	-	-	-	19	58	63	140

¹ Electrofishing was not done at this site.

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**TABLE 3.0-8
NUMBER OF FISH CAUGHT IN GILL CREEK DURING 2004 AT SITE 5 BY COMMON NAME, METHOD OF CAPTURE, AND MONTH**

Common Name	Number Caught						Total
	Electrofishing			Seining ¹			
	May	July	September	May	July	September	
Bluegill	1		2	-	-	-	3
Bluntnose minnow	3	1	13	-	-	-	17
Carp	3			-	-	-	3
Largemouth bass			1	-	-	-	1
Logperch		3	3	-	-	-	6
Pumpkinseed	1	4	3	-	-	-	8
Rainbow darter		1		-	-	-	1
Rock bass	6	9	10	-	-	-	25
White sucker	2	2	3	-	-	-	7
Yellow bullhead			1	-	-	-	1
Total	16	20	36	-	-	-	72

¹ Seining was not done at this site.

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TABLE 3.0-9

NUMBER OF FISH CAUGHT IN GILL CREEK DURING 2004 AT SITE 6 BY COMMON NAME, METHOD OF CAPTURE, AND MONTH

Common Name	Number Caught						
	Electrofishing ¹			Seining			Total
	May	July	September	May	July	September	
Bluegill	-	-	-	1			1
Bluntnose minnow	-	-	-	36		5	41
Total	-	-	-	37		5	42

¹Electrofishing was not done at this site. No fish were captured during the July seining.

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**TABLE 3.0-10
NUMBER OF FISH CAUGHT IN GILL CREEK DURING 2004 AT SITE 7 BY COMMON NAME, METHOD OF CAPTURE, AND MONTH**

Common Name	Number Caught						Total
	Electrofishing ¹			Seining ²			
	May	July	September	May	July	September	
Bluegill	-	1		5	10	-	16
Bluntnose minnow	-	2	42	4	3	-	51
Carp	-	1	1			-	2
Creek chub	-		1			-	1
Golden shiner	-			5		-	5
Largemouth bass	-		1	1		-	2
Logperch	-	1	3		1	-	5
Pumpkinseed	-	1	1		12	-	14
Rainbow darter	-		2			-	2
Rock bass	-	4	3	9	15	-	31
White sucker	-	1		5	3	-	9
Total	-	11	54	29	44	-	138

¹ Electrofishing was not done at this site during May.

² Seining was not done at this site during September.

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**TABLE 3.0-11
NUMBER OF FISH CAUGHT IN GILL CREEK DURING 2004 AT SITE 8 BY COMMON NAME, METHOD OF CAPTURE, AND MONTH**

Common Name	Number Caught						Total
	Electrofishing			Seining			
	May	July	September	May	July	September	
Bluegill						1	1
Bluntnose minnow	24	7	11	113	2	7	164
Central mudminnow	1		2				3
Creek chub	32	21	9	21	11	10	104
Creek chub/fallfish ¹				1			1
Minnows ²		2					2
Pumpkinseed			1		1		2
Rock bass	3	1	1	4	1		10
Round goby						1	1
Spottail shiner					1		1
Suckers ³		5					5
White sucker	9	40	8	13	12	4	86
Total	69	76	32	152	28	23	380

¹ Small young of year in the *Semotilus* genus that could not be identified to species.

² Small young of year in the minnow family (Cyprinidae) that could not be identified to species.

³ Small young of year in the sucker family (Catostomidae) that could not be identified to species.

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TABLE 3.0-12

NUMBER OF FISH CAUGHT IN GILL CREEK DURING 2004 AT SITE 9 BY COMMON NAME, METHOD OF CAPTURE, AND MONTH

Common Name	Number Caught						Total
	Electrofishing			Seining ¹			
	May	July	September	May	July	September	
Bluntnose minnow	7	5		-	-	-	12
Creek chub	19	10	5	-	-	-	34
White sucker	1	12	2	-	-	-	15
Total	27	27	7	-	-	-	61

¹ Seining was not done at this site.

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TABLE 3.0-13

NUMBER OF FISH CAUGHT IN GILL CREEK DURING 2004 AT SITE 10 BY COMMON NAME, METHOD OF CAPTURE, AND MONTH

Common Name	Number Caught						Total
	Electrofishing			Seining ¹			
	May	July	September	May	July	September	
Blacknose dace		6	2	-	-	-	8
Bluntnose minnow	1	6	6	-	-	-	13
Creek chub	7	6	18	-	-	-	31
Minnows ²		5		-	-	-	5
Round goby			2	-	-	-	2
White sucker	1	4	4	-	-	-	9
Total	9	27	32	-	-	-	68

¹ Seining was not done at this site.

² Small young-of-year in the minnow family (Cyprinidae) that could not be identified to species.

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TABLE 3.0-14

NUMBER OF FISH CAUGHT IN GILL CREEK DURING 2004 AT SITE 11 BY COMMON NAME, METHOD OF CAPTURE, AND MONTH

Common Name	Number Caught						Total
	Electrofishing ¹			Seining ¹			
	May	July	September	May	July	September	
Blacknose dace		15	10	1			26
Bluntnose minnow	9	27	7	13	2	1	59
Brook stickleback				1			1
Central mudminnow	1		2	2			5
Central stoneroller	1						1
Creek chub	7	4	1	62	9	5	88
Creek chub/fallfish				3			3
Fathead minnow				1			1
Mottled sculpin			3				3
Round goby		1	1	1	1	1	5
Sculpin species		1					1
Unknown ²		1					1
White sucker		2		3		1	6
Total	18	51	24	87	12	8	200

¹ Electrofishing was conducted independently and upstream of the 20-foot seine haul.

² Individual was too small to identify to family level.

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TABLE 3.0-15

NUMBER OF FISH CAUGHT IN GILL CREEK DURING 2004 AT SITE 12 BY COMMON NAME, METHOD OF CAPTURE, AND MONTH

Common Name	Number Caught						Total
	Electrofishing			Seining ¹			
	May	July	September	May	July	September	
Bluntnose minnow		1	3	-	-	-	4
Brook stickleback		1		-	-	-	1
Central mudminnow	4	12	7	-	-	-	23
Creek chub	2	6	7	-	-	-	15
Creek chub/fallfish ²	1			-	-	-	1
Mottled sculpin			1	-	-	-	1
Round goby	4			-	-	-	4
White sucker	1	2		-	-	-	3
Total	12	22	18	-	-	-	52

¹ Seining was not done at this site.

² Small young of year in the *Semotilus* genus that could not be identified to species.

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TABLE 3.0-16

NUMBER OF FISH CAUGHT IN GILL CREEK DURING 2004 AT SITE 13 BY COMMON NAME, METHOD OF CAPTURE, AND MONTH

Common Name	Number Caught						Total
	Electrofishing			Seining ¹			
	May	July	September	May	July	September	
Bluegill	1			-	-	-	1
Central mudminnow	1	2	1	-	-	-	4
Creek chub	6	1		-	-	-	7
White sucker	2	1		-	-	-	3
Total	10	4	1	-	-	-	15

¹ Seining was not done at this site.

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TABLE 3.0-17

NUMBER OF FISH CAUGHT IN GILL CREEK DURING 2004 AT SITE 14 BY COMMON NAME, METHOD OF CAPTURE, AND MONTH

Common Name	Number Caught						Total
	Electrofishing			Seining			
	May	July	September	May	July	September	
Blacknose dace		1			2	3	6
Bluegill			14			30	44
Bluntnose minnow		9	2			8	19
Brook stickleback	9	66	1	19	23		118
Brown bullhead		2		3	4	2	11
Central mudminnow	58	306	16	21	91	2	494
Central stoneroller			4			1	5
Creek chub	6	4	70	40	9	238	367
Fathead minnow	15	25	1	121	75	140	377
Minnows			1				1
Pumpkinseed			13	2		7	22
White sucker	16	9	13	81	31	167	317
Total	104	422	135	287	235	598	1781

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TABLE 3.0-18

NUMBER OF FISH CAUGHT IN GILL CREEK DURING 2004 AT SITE 15 BY COMMON NAME, METHOD OF CAPTURE, AND MONTH

Common Name	Number Caught						Total
	Electrofishing			Seining ¹			
	May	July ²	September ³	May	July	September	
Central mudminnow	14	-	-	-	-	-	14
Total	14	-	-	-	-	-	14

¹ Seining was not done at this site.

² Gill Creek upstream of Garlow Road was dry; therefore, no sampling was performed on Tuscarora Nation land in July.

³ No sampling was performed on Tuscarora Nation land in September.

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TABLE 3.0-19

NUMBER OF FISH CAUGHT IN GILL CREEK DURING 2004 AT SITE 16 BY COMMON NAME, METHOD OF CAPTURE, AND MONTH

Common Name	Number Caught						Total
	Electrofishing ¹			Seining ¹			
	May	July ²	September ³	May	July ²	September ³	
Brook stickleback	4	-	-	1	-	-	5
Central mudminnow	15	-	-		-	-	15
Total	19	-	-	1	-	-	20

¹ Electrofishing was conducted upstream and independently of the 20-foot seine haul.

² Gill Creek upstream of Garlow Road was dry; therefore, no sampling was performed on Tuscarora Nation land in July.

³ No sampling was performed at this site in September.

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TABLE 3.0-20

**TOTAL LENGTH (MM) OF FISH CAUGHT IN GILL CREEK DURING 2004 AND MEASURED AT SITE 1 BY COMMON NAME,
METHOD OF CAPTURE, AND MONTH**

Common Name	Total Length (mm)					
	Electrofishing ¹			Seining ¹		
	May	July	September	May	July	September
Largemouth bass			63			96
			84			87
			95			63
			72			91
			78			63
Smallmouth bass			64			

¹ Electrofishing downstream into a blocking seine.

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TABLE 3.0-21

**TOTAL LENGTH (MM) OF FISH CAUGHT IN GILL CREEK DURING 2004 AND MEASURED AT SITE 2 BY COMMON NAME,
METHOD OF CAPTURE, AND MONTH**

Common Name	Total Length (mm)					
	Electrofishing ¹			Seining ²		
	May	July	September	May	July	September
Largemouth bass	-	-	-	113	162	57
	-	-	-			72
	-	-	-			63
	-	-	-			53

¹ Electrofishing was not done at this site.

² 50-foot seine.

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TABLE 3.0-22

**TOTAL LENGTH (MM) OF FISH CAUGHT IN GILL CREEK DURING 2004 AND MEASURED AT SITE 3 BY COMMON NAME,
METHOD OF CAPTURE, AND MONTH**

Common Name	Total Length (mm)					
	Electrofishing			Seining ¹		
	May	July	September	May	July	September
Largemouth bass		36	75		35	65
		41	70			73
		41	59			63
		36	66			105
		36				
Smallmouth bass				190		

¹ Electrofishing downstream into a blocking seine.

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TABLE 3.0-23

**TOTAL LENGTH (MM) OF FISH CAUGHT IN GILL CREEK DURING 2004 AND MEASURED AT SITE 4 BY COMMON NAME,
METHOD OF CAPTURE, AND MONTH**

Common Name	Total Length (mm)					
	Electrofishing ¹			Seining ²		
	May	July	September	May	July	September
Largemouth bass	-	-	-		42	
	-	-	-		108	
	-	-	-		38	
	-	-	-		42	

¹ Electrofishing was not done at this site.

² 50-foot seine.

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TABLE 3.0-24

**TOTAL LENGTH (MM) OF FISH CAUGHT IN GILL CREEK DURING 2004 AND MEASURED AT SITE 5 BY COMMON NAME,
METHOD OF CAPTURE, AND MONTH**

Common Name	Total Length (mm)					
	Electrofishing			Seining ¹		
	May	July	September	May	July	September
Largemouth bass			71	-	-	-

¹ Seining was not done at this site.

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TABLE 3.0-25

**TOTAL LENGTH (MM) OF FISH CAUGHT IN GILL CREEK DURING 2004 AND MEASURED AT SITE 7 BY COMMON NAME,
METHOD OF CAPTURE, AND MONTH**

Common Name	Total Length (mm)					
	Electrofishing			Seining		
	May ¹	July ²	September ³	May ¹	July ²	September ³
Largemouth bass	-		67	210		-

¹ Gear used in May was a 20-foot seine only.

² Method used in July included electrofishing downstream into a blocking seine (no largemouth bass were caught).

³ Method used in September included electrofishing only.

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REFERENCES

- Arend, K. 1999. Macrohabitat Classification. In: Aquatic Habitat Assessment: Common Methods. ed. M.B. Bain and N.J. Stevenson. Bethesda, MD: American Fisheries Society. pp. 75-93.
- Nelson, J.S., E.J. Crossman, H Espinosa-Perez, L.T. Findley, C.R. Gilbert, R.N. Lea, and J.D. Williams. 2004. Common and Scientific Names of Fishes from the United States, Canada, and Mexico, Sixth Edition. Special Publication 29. Bethesda, MD: American Fisheries Society.

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APPENDIX A

Standard Operating Procedures

Objective

Determine the taxonomic groups of fish present in Gill Creek and their relative abundance during spring, summer and fall of 2004.

Investigation Area

The investigation area was Gill Creek from Buffalo Avenue, to approximately 2,500 feet upstream of Garlow Road on Tuscarora Land ([Figure 2.1-1](#)). Tributaries of Gill Creek and Hyde Park Lake were not included in the investigation area.

Sites

At least one site in each of twelve reaches that were identified in the report entitled “Ecological Condition of Gill, Fish, and Cayuga Creeks” will be sampled if water conditions permit, except for Reaches G1 (downstream of Buffalo Avenue), G6 (the portion of Gill Creek that passes through a concrete culvert, underneath an active rail yard), and G7 (the pond just downstream of the rail yard).

Sampling

Sampling will be done during daylight hours by backpack electrofishing, seining, or a combination of the two. The sampling gear to use will be selected based on condition found at each site.

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Seining -- Two bag seines will be available for this project, and used as appropriate. A large (50 ft x 6 ft x ¼ in) or a small (20 ft x 6 ft x ¼ in) seine will be deployed depending on field conditions. Seining will be conducted as possible in shallow waters with smooth bottom where it is most effective.

The lead line must remain in contact with the bottom to prevent fish from escaping under the net. If the lead line gets snagged, the bag section will be lifted just enough so that the obstacle is cleared. Snags as discussed above will be noted in the pen computer.

If target species are observed escaping, the seine haul will be redone in a different location that has not been disturbed by the first pull. A haul will still be acceptable if the net gets snagged as long as fish are not observed escaping.

One end of the bag seine will be kept close to shore while the other person moves offshore to extend the net. Both ends of the seine will then be moved simultaneously over a distance moving in an upstream direction.

When the haul is completed, the offshore end will be brought back to shore so that both ends are rejoined. The seine will be brought back onto shore by having one person hauling both lead lines together as close to the bottom as possible while the other person pulls on the floating top line on either side.

If more appropriate to a station, and as an alternative to the above, the offshore pole (brail) will be swept upstream to shore making an arc with the shore-brail as the fixed center of the arc.

Electrofishing -- Electrofishing will be conducted using a Smith-Root type L-24 backpack electrofishing unit. Electrofishing is hazardous work. Batteries and generator can produce enough energy to injure or kill a person.

Currents applied at 20-500 Hz and as low as 0.0002 amps can cause serious injury or death. Death is usually a result of respiratory arrest, asphyxia or ventricular fibrillation.

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All members of the electrofishing crew will have received orientation on equipment and procedures. The crew will be constituted of at least one experienced operator.

The electrofishing equipment will be inspected to check for and eliminate loose or frayed wires and connectors at each site before being used.

All crew members must wear the following protective equipment:

- Rubber soled shoes/boots and rubber gloves.
- Ear plugs/muff as appropriate

Mammals, birds, reptiles, amphibians and mollusks are to be avoided when possible.

Backpack electrofishing will be conducted during daylight. Electrofishing will be carried out as much as possible in an upstream direction in shallow habitats, corresponding to habitats in small streams. Moving in an upstream direction will avoid silt suspended by electrofishing activities and optimize visibility.

All fish, regardless of species, will be captured by dip netting.

Seining and Electrofishing -- As determined by field conditions, a combination of seining and backpack electrofishing may be used. The seine will be set across the entire watered area at the downstream end of an electrofishing area. Electrofishing will be conducted from upstream to downstream, and will end at the seine location. As soon as electrofishing is completed, the seine will be hauled. One end will be brought to the other end, which will remain stationary, so that both ends are rejoined. One end of the seine will be brought to the other end by having one person hauling both lead lines together as close to the bottom as possible while the other person pulls on the floating top line on either side.

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All fish captured during the electrofishing will be enumerated separately from those captured in the seine. The electrofishing and seine data will be considered separate activities.

Species Identification, Enumeration and Length Measurements

Captured fish caught will be identified to the species level, enumerated, and returned to the site of capture. If, at the time of capture, a positive identification cannot be made, a representative sample of those fish will be preserved in isopropyl alcohol and examined at a later time. It is acceptable to identify young-of-the-year sunfish and minnows to the level of genus if a positive identification cannot be made at the time of capture. If a fish that is a rare, threatened, endangered species (RTE) or species of concern (SOC) is collected, it will be returned to the river alive immediately after a positive identification is made. All dead RTE and SOC will be frozen and saved. NYPA will be notified of such capture as soon as possible (within 24 hours). The New York State Department of Environmental Conservation will be notified of such capture at the end of the sampling season as required by the License to Collect and Possess Specimens.

Records of all fish preserved will be entered into the pen computer as "Unknown A", "Unknown B", "Unknown C", etc., for each location. For each of these records, enter the number of fish preserved in the "Remark" field.

Any largemouth bass, smallmouth bass, yellow perch, or fish in the pike family caught will be measured to the nearest mm and examined for sexual condition and for obvious external injuries.

All spatial and fish data will be entered into a pen computer or onto cotton-based paper datasheets if the pen computer malfunctions.

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APPENDIX B

Water Quality Data Collected in Gill Creek

Water Quality Data Collected in Gill Creek during May 2004

Date	Site	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Conductivity (µs/cm)³
May 20	1 ¹	21.9	8.8	-
May 20	1 ²	21.9	8.8	-
May 20	2	21.7	8.4	-
May 20	3	22	7.7	-
May 20	3	22	7.7	-
May 20	4	19.6	8.6	-
May 20	5	18	9.4	-
May 20	6	16.7	9.7	-
May 20	7	15.7	9	-
May 20	8	14.7	9.6	-
May 20	9	14	8.9	-
May 20	10	13.9	8.3	-
May 19	11 ²	16.7	9.8	-
May 19	11 ¹	16.6	9.8	-
May 19	12	16.3	10.6	-
May 19	13	21.1	8.5	-
May 19	14 ¹	21.3	12.8	-
May 19	14 ²	22.3	13.8	-
May 19	15	20	11.2	-
May 19	16 ²	17.2	7.89	-
May 19	16 ¹	17.3	7.5	-

¹Electrofishing

²Blocking seine or seine haul.

³Conductivity was not measured in May.

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Water Quality Data Collected in Gill Creek during July 2004

Date	Site	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Conductivity (µs/cm)
July 12	1 ¹	23.5	2.62	542
July 12	1 ²	23.5	2.62	542
July 12	2	23.2	2.87	555
July 12	3	23.4	3.74	543
July 12	3	23.4	3.74	543
July 12	4	24.3	7.1	493
July 12	5	21.3	8.14	397
July 12	6	21.1	8.33	430
July 12	7	21.3	8.9	410
July 12	7	21.3	8.9	410
July 12	8 ¹	21.9	8.3	377
July 12	8 ²	21.9	8.3	377
July 12	9	22	8.34	407
July 12	10	21.6	7.76	372
July 12	11 ¹	21.5	8.48	385
July 12	11 ²	21.5	8.48	385
July 12	12	20.7	7.98	402
July 12	13	20.5	7.51	715
July 12	14 ¹	25	7.48	1032
July 12	14 ²	25	7.48	1032

¹Electrofishing

²Blocking seine or seine haul.

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Water Quality Data Collected in Gill Creek during September 2004

Date	Site	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Conductivity (µs/cm)
September 22	1 ¹	16.7	4.02	477
September 22	2	16.7	3.88	466
September 22	3 ¹	16.7	5.29	473
September 22	4	17.7	6.76	447
September 22	5	18.4	10.94	420
September 22	6	19	11.6	400
September 22	7	18.1	8.43	400
September 22	8 ¹	19.5	9.33	382
September 22	9	19.5	9.36	401
September 22	10	19.3	8.66	409
September 22	11 ²	19.1	8.78	408
September 22	12	19.1	8.85	392
September 22	13	19	11.12	570
September 22	14 ¹	20.3	7.23	608

¹At sites with combination electrofishing and seining, water quality data were collected once.

²Electrofishing and seine haul (i.e., not a blocking seine) was done at Site 11. Water quality data were collected once at this site in September.